

REFERENCES.

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EXAMINATION OF THE JUICES OF THE LEAVES OF MONARDA PUNCTATA AND MONARDA FISTULOSA.*

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In order to supplement our knowledge concerning these two plants, it was thought advisable to investigate several physical and chemical characteristics of the freshly expressed juice from the leaves. The leaves were picked and immediately placed in bottles of approximately one-liter capacity with 25 cc. of ether and stoppered securely. The bottles were then placed in a refrigerator over night. The leaves were ground in a food chopper and the sap expressed in a mechanical press. The juice was clarified in a centrifuge and the refractive index determined at 20° C. with an Abbe refractometer.

DETERMINATION OF THE BOUND WATER CONTENT.

The method devised by Newton and Gortner¹ was used for this purpose. The percentage of total solids was obtained by use of the refractive index by consulting the table of Schönrock.² The freezing point of the sap was then determined using the ordinary cryoscopic method for this purpose. A sample of the juice was then taken which contained exactly 10 Gm. of water and 0.01 mol. of sugar was added and the freezing point of the sugar solution determined as above. From the data obtained in this manner, the bound water content was calculated using the Newton-Gortner formula for this purpose. The following is a table of the results:

Juice.	Ref. Index.	P. c. Water.	F. P. Sap.	F. P. Sap and Sugar.	Depr.	P. c. Bound Water.
<i>M. fistulosa</i>	1.3437	92.7	-1.03° C.	-3.37° C.	2.34° C.	9.7
<i>M. punctata</i>	1.3437	92.7	-0.91° C.	-3.15° C.	2.24° C.	6.2

A check on the accuracy of the refractive index as a method for the determination of total solids was obtained by evaporating a sample of the sap to constant weight at 60° C. The average results of three samples each of the juices of the leaves of the two plants are as follows: 92.2 p. c. water in the case of *M. punctata*

* From the Laboratory of Edward Kremers.

¹ R. Newton and A. G. Gortner, *Bot. Gaz.*, 74 (1922), 442.

² "Off. & Tent. Methods of Analysis," *A. O. A. C.*, 3rd Edition, page 510.

and 92.8 p. c. for *M. fistulosa*, checking closely with the results obtained by means of the refractive index.

ASH CONTENT OF THE LEAF JUICES.

For this purpose, an indefinite amount of the sap was evaporated under identical conditions as in the case of the determination of the total solids, and a weighed sample subjected to the usual procedure for ash determination. The results are as follows (calculated to the basis of the sap):

Monarda Punctata.			
	I. P. c.	II. P. c.	III. P. c.
Water-soluble ash	0.49	0.49	0.50
Water-insoluble ash	0.92	0.92	0.93
	—	—	—
Total ash	1.41	1.41	1.43
The water-insoluble ash resolved into:			
	P. c.	P. c.	P. c.
Acid-soluble ash	0.90	0.90	0.90
Acid-insoluble ash	0.02	0.02	0.03

Monarda Fistulosa.			
	P. c.	P. c.	P. c.
Water-soluble ash	0.74	0.73	0.81
Water-insoluble ash	0.72	0.74	0.72
	—	—	—
Total ash	1.46	1.47	1.53
The water-insoluble ash resolved into:			
	P. c.	P. c.	P. c.
Acid-soluble ash	0.70	0.73	0.71
Acid-insoluble ash	0.02	0.009	0.009

SUGAR CONTENT OF THE SAP.

The reducing and invert sugar content of the sap was determined by the method of Dunlap.¹ The following results were obtained:

	Reducing Sugars.	Invert Sugars.
<i>M. punctata</i>	0.46 p. c.	0.12 p. c.
<i>M. fistulosa</i>	1.39 p. c.	0.01 p. c.

SUMMARY.

(1) Comparative results of the bound water content of the juices of leaves of *Monarda punctata* and *Monarda fistulosa* were obtained.

(2) The ash content of the residue of the juices and the reducing and invert sugar content of the juices were determined.

¹ A. A. Dunlap, *Am. J. Bot.*, 18 (1931), 328.

State Associations and other organizations entitled to representation should not overlook the appointment of delegates to the House of Delegates, A. P. H. A., the Conference of Pharmaceutical Secretaries and Conference of Pharmaceutical Law Enforcement Officials—Toronto, Canada, during the week of August 22nd.